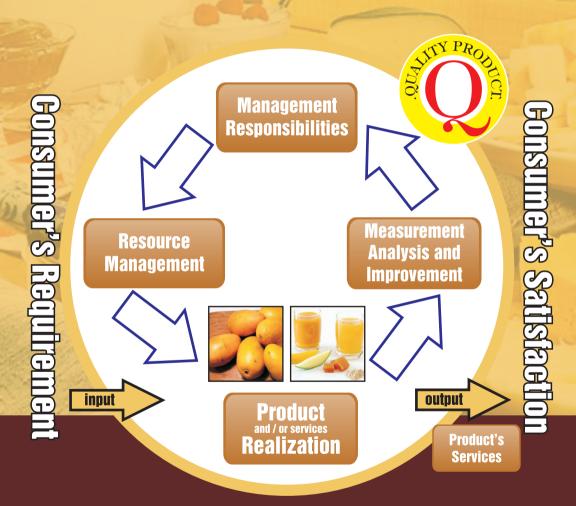
# Quality Control for Value Addition in Food Processing



Dev Raj, Rakesh Sharma and VK Joshi







# Quality Control for Value Addition in Food Processing

by

### **DEV RAJ**

Scientist (Food Technology)

### **RAKESH SHARMA**

Assistant Professor (PHT)

### **VKJOSHI**

Professor & Head
Department of Post Harvest Technology

Dr YS Parmar University of Horticulture & Forestry Nauni, Solan, HP 173230 (INDIA)

2011



# **New India Publishing Agency**

Pitam Pura, New Delhi- 110 088

Published by Sumit Pal Jain for

# New India Publishing Agency

101, Vikas Surya Plaza, CU Block, L.S.C. Mkt., Pitam Pura, New Delhi- 110 088, (India) Phone: 011-27341717, Fax: 011-27341616

Mobile: 09717133558

E-mail: newindiapublishingagency@gmail.com

Web: www.bookfactoryindia.com

© Authors: 2011

All rights reserved, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior written permission of the publisher/editor/author.

This book contains information obtained from authentic and highly regarded sources. Reasonable efforts have been made to publish reliable data and information, but the authors/editor(s)/contributors and publisher cannot assume responsibility for the validity of all materials or the consequences of their use. The authors/editor(s)/contributors and publisher have attempted to trace and acknowledge the copyright holders of all material reproduced in this publication and apologize to copyright holders if permission and acknowledgements to publish in this form have not been given. If any copyright material has not been acknowledged please write and let us know so we may rectify it.

ISBN: 978-93-80235-57-8

Typeset at: Harminder for Laxmi Art Creations # 98 11 48 23 28

Printed at: Jai Bharat Printing Press, Delhi

# CONTENTS

Foreword	ขาา
Preface	ix
Acronyms / Abbreviations	xv
List of Tables	xvii
List of Figures	xix
List of Plates	xxiii
Chapter 1 : Food Processing Industry: An Orientation	1
1.0. Introduction	2
1.1. Food Processing Industry	3
1.2. Specific Food Processing Sectors	3
1.3. Problems and Constraints of Food Industries	7
1.4. Future Strategy to Overcome Problems	8
1.5. Prospects of Food Processing Industry	9
1.6. Potential for Growth of Food Processing Industry	9
1.7. Future Outlook and Challenges	10
Chapter 2: Processing Plant	13
2.0. Introduction	14
2.1. Processing Plant	14
2.2. Investment Needed	14
2.3. Location of Processing Units / Site Selection	
2.4. Design of Processing Plant	16
2.5. Water Supply and Drainage	
2.6. Staff	
2.7. Machinery and Equipments	18

## Contents / xii

2.8. Layout of Food Processing Plant	. 18
2.9. Sanitary Requirements	28
2.10. Guidelines for Setting Up of Unit	29
Chapter 3: Processing Plant Hazards	39
3.0. Introduction	
3.1. Biological Hazards	40
3.2. Chemical Hazards	46
3.3. Physical Hazards	50
3.4. Possible Control of Physical Hazards	53
3.5. People with A Higher Risk of Food-Borne Illness with Food Hazards	53
3.6. Major Risk Factors For Hazards	54
3.7. Hazards Control	54
Chapter 4: Quality Characteristics	57
4.0. Introduction	
4.1. Characteristics of Quality	. 58
4.1.1. Sensory Characteristics	. 58
4.1.2. Hidden Characteristics	61
4.1.3. Quantitative Characteristics	61
4.2. Methods for Determining Quality	61
4.2.1. Subjective Method	61
4.2.2. Objective Methods	62
4.3. Factors Influencing Quality of Food	62
4.3.1. Genetic Factor	65
4.3.2. Preharvest Factors	65
4.3.3. Harvesting Factor	67
4.3.4. Post Harvest Factors	68
Chapter 5: Quality Control and Management	71
5.0. Introduction	
5.1. Main Aspects / Reasons for Quality Control	. 72
5.2. Primary Objective of Quality Control	
5.3. Principles of Quality Control	. 72
5.4. Benefits /Reason of Quality Control/ Evaluation	
5.5. Specific Responsibilities of Quality Control Department	
5.6. Basic Fundamental for Quality Control Programme	75
5.7. Quality Management System	
5.8. Sequence of Operation in Quality Control	
5.9. How Research Contributes Toward Quality Control?	
5.10. Prospects for Quality Control Services	

Chapter 6: Food Standards and Statutes	101
6.0. Introduction	102
6.1. Quality Standards	102
6.2. Why Food Standards?	
6.3. Why Food Laws?	104
6.4. Indian Standards / Laws and Regulations	
6.5. International Standards and Regulations	
Chapter 7 : Food Safety Assurance Systems	125
7.0. Introduction	126
7.1 Quality / Safety Assurance Systems	126
7.1.1. Good Agricultural Practices	127
7.1.2. Good Manufacturing Practices	128
7.1.3. Good Hygiene Practices	129
7.1.4. Hazard Analysis And Critical Control Points (HACCP)	133
7.1.5. Total Quality Management (TQM)	145
Chapter 8: Additives in Food Processing	149
8.0. Introduction	
8.1. Classification of Food Additives	150
8.2. Food Additives Depending Upon Properties and Applications	151
8.3. Advantages of Additives in Foods	166
8.4. Safety Assessment	166
8.5. Fact / Fiction About Food Additives	169
Chapter 9: Enzymes in Food Processing	171
9.0. Introduction	172
9.1. Merits of Enzymes over Catalyst	172
9.2. Importance of The Enzymes in Food Processing	173
9.3. Properties of Enzymes	174
9.4. Enzymes Used in the Food Processing Industry	174
Chapter 10: Waste Management in Food Processing.	177
10.0. Introduction	178
10.1. Waste Management Strategies	179
10.2. Waste Utilization	180
10.3. Advantages of Waste Utilization	186

Chap	oter 11 : Marketing and Export Management	187
	D. Introduction	
	1. Marketable Surpluses	
	2. Marketing	
	3. Basic Fundamentals of Marketing Systems	
	4. Marketing Channels	
	5. Standards for Domestic and Export Markets	
	6. Price Fixation in the Market	
	7. Prospects of Marketing	
Chap	oter 12 : Practical Methods for Quality Control	221
_	0. Introduction	
12.	1. Methods for Quality Control / Evaluation	222
	12.1.1. Subjective Method	
	12.1.2. Objective Methods	
	12.1.2.1. Physical Method	
	12.1.2.2. Chemical Method	
	12.1.3. Microscopic / Microbiological Methods	
	2. Main Objective of Entire Quality Evaluation	
Gloss	sary	273
Sugg	ested Reading	287
Anne	exures	295
- 1	Minimum Permissible Limits of Preservatives in Fruit and	
	Vegetable Products (FPO Specifications)	295
П	Temperature Correction for the Standard Model of Sugar	
	Refractometer Calibrated at 20°C	297
Ш	Various Types of Machinery and Equipments Used in the Food Processing	200
IV	Potential Hazards: Their Characteristics and Effect on Human	290
ıv	Health	200
V	Major Standardization Systems for Quality Control of Foods	
۷I	List of Additives / Food Covered under PFA Act, 1954	
VII	Standard Units of Measurements	
	Hedonic Rating Test for Evaluating Sensory Quality	
	(Specimen Evaluation Card)	308
IX	Different Forms to be Filled by the Applicant to Obtain Licence	
	for Food Processing	
X	Preparation and Calibration of Standard Curve / Table	
Index	<b>S</b>	312

# Quality Control for Value Addition in Food Processing

Dev Raj: Scientist (Food Technology), Rakesh Sharma: Assistant Professor (PHT), & V K Joshi: Professor & Head, Department of Post Harvest Technology, Dr YS Parmar University of Horticulture & Forestry, Nauni, Solan, Himachal Pradesh 173 230, India

The students, teachers, and researchers often need a direct reference which is complete on the subject for teaching undergraduate or postgraduate students. The book on "Quality Control for Value Addition in Food Processing" consists of 12 chapters on Food Processing Industry, Processing Plant, Processing Plant Hazards, Quality Characteristics, Quality Control and Management, Food Standards and Statutes, Food Safety Assurance Systems, Additives in Food Processing, Enzymes in Food Processing, Waste Management in Food Industry, Marketing and Export Management, Practical Methods for Quality Control along with glossary and annexures.

The text in the chapter has been illustrated with tables, figures and plates for better understanding of the contents. The book chapters have been designed as per the ICAR syllabus for UG and PG students. At present, there is no book available which gives an orientation for quality control in food processing industry. The book will be highly beneficial to both UG and PG students undergoing courses in Postharvest Technology, Food Technology, Food Science and Technology as well as for professionals related to quality management systems in food processing industry.

2011, xxiv+ 348p.,figs.,tabls.col.plts.,ind.,25cm

## **NEW INDIA PUBLISHING AGENCY**

101, Vikas Surya Plaza, CU Block, L.S.C. Mkt. Pitam Pura, New Delhi- 110088, India Tel: +91-011-27341717, 27341616

Email: newindiapublishingagency@gmail.com

Web: www.bookfactoryindia.com

